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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/758,049	01/16/2004	Christopher P. R. Hill	118285	6135
25944	7590	12/30/2005		
OLIFF & BERRIDGE, PLC P.O. BOX 19928 ALEXANDRIA, VA 22320			EXAMINER ADDISU, SARA	
			ART UNIT	PAPER NUMBER
			3722	
DATE MAILED: 12/30/2005				

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/758,049

Applicant(s)

HILL ET AL.

Examiner

Sara Addisu

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 27 September 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-11 and 15-17 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-11 and 15-17 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 16 January 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)             | 4) <input type="checkbox"/> Interview Summary (PTO-413)                     |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)    | Paper No(s)/Mail Date. _____  |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____   | 6) <input type="checkbox"/> Other: _____                                    |

### **DETAILED ACTION**

The abstract of the disclosure is objected to because the reference numbers are not in parenthesis. Correction is required. See MPEP § 608.01(b).

### ***Response to Arguments***

Applicant's arguments, filed 9/27/05, with respect to the rejection(s) of claim(s) 1-14 have been fully considered and are persuasive. However, upon further consideration, a new ground(s) of rejection is made in view of newly found prior art reference.

### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

1. Claims 1, 3, 8, 10, 15 and 16 are rejected under 35 U.S.C. 102(b) as being anticipated by Lowe (USP 6,077,002).

LOWE teaches a method of producing from a workpiece, a finished disc in a disc assembly, for a gas turbine engine, the workpiece having a hub (12) and a disc

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extending radially outwardly from the hub portion (12) which forms a support surface ('002, figure 1, Col. 3, lines 39-49). LOWE teaches in figures 1 & 2, end mill/tool (22) having access to both axial faces of the disc during machining. LOWE also teaches in figure 2, the step milling process by alternately repeating the groove and sidewall cutting by end mill (22) (i.e. performing a sequence of machining operations alternately on opposite sides of the disc), to form a corresponding pocket (30) along which the sidewall (28) extends ('002, figure 2 and Col. 4, lines 23-33). Regarding claim 3, Figure 3 shows the support surface being cylindrical and aligned with a longitudinal axis of the workpiece. Regarding claim 8, Figures 1 and 2 show the end mill (22) having access to both sides of the disc and therefore the outer periphery of the disc is unconstrained during at least some of the machining operations. Regarding claim 10, LOWE teaches although the same mill (22) may be used in a first pass to cut a single groove (26), and then fed again over that groove to use the mill side (34) to finish machine the sidewall 28, it is preferred to cut the several grooves (26) for initially widening the pocket (30) in multiple rough machining radial levels or steps followed in turn by finish machining the two sidewalls (28) using the same mill (22) (i.e. semi-finish machining), and then alternately repeating the groove and sidewall cutting to deepen the pocket 30 to its final (i.e. finish machining) and full depth in the perimeter of the blank ('002, Col. 5, lines 3-12).

2. Claims 1, 3 and 5-8 are rejected under 35 U.S.C. 102(b) as being anticipated by Schenk (USP 2,633,776).

SCHENK teaches a method of producing from a workpiece, a finished disc for a gas turbine engine, the workpiece (10) having a hub (2) and a disc extending radially outwardly from the hub portion ('776, Figures 1 and 5). SCHENK also teaches the hub having a cylindrical shaft (8) that has a longitudinal axis that is aligned with workpiece and performs as a support surface that supports the workpiece in a machine tool such that there is tool access to both axial faces of the disc during machining ('776, figure 1, Col. 2, lines 44-50). SCHENK teaches cutter (14) passing through the disc as shown in figures 3, 4 and 6. The cutter moves from one side/face of the disc to the other side/face (i.e. alternatively) and repeats the cycle until the desired depth is achieved (therefore performs sequence of machining operations alternatively on both sides of the disc. Furthermore, SCHENK teaches the support surface (8) being an external surface of the hub ('776, figures 1 and 5) and the workpiece is supported by a fixture (4) which engages the support surface (8) and is non-rotatably secured to the workpiece ('776, figure 1 and Col. 2, lines 44-50). In addition to the fixture, a tailstock (6) engages the workpiece at a position spaced from the fixture (4). SCHENK teaches in I-4, the cutter (14) having access to both sides of the disc and therefore the outer periphery of the disc is unconstrained during at least some of the machining operations.

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 4, 9 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lowe (USP 6,077,002).

Regarding Claim 4, LOWE teaches the disc being milled/ machined in a conventional multi-axis milling machine (20) specifically configured for rotating a cutting tool for point milling. LOWE also teaches the blank being mounted in the machine (20) relative to the mill (22) typically with five degrees or axes of movement for following complex 3-D milling paths through the blank 10 which is accomplished in multiple steps or levels radially inwardly from the perimeter of the blank (10) down to the hub (12) ('002, Figure 1 and Col. 3, line 62 through Col. 4, line 5). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention was made to mount the disc internally (i.e. support surface being an internal surface of the hub) because it is old and well known to support a workpiece internally in a machining environment.

Regarding Claim 11, LOWE teaches in Figure 1, end mill (22) removing material (thickness being reduced) from the disc area early in the machining operation. Since the

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hub is stiffer than the disc (therefore has low residual distortion/stress), the machining operation therefore takes place in regions of the workpiece where there is high residual stress early in the sequence of operations.

Regarding claim 9, LOWE teaches several steps of machining using cutting tool (22): (step 1) mill side (34) in multiple rough machining radial levels or steps, (step 2) finish machining the two sidewalls (28), (step 3) by alternately repeating the groove and sidewall cutting, deepen the pocket 30 to its final and full depth ('002, Col. 5, lines 3-12). Examiner interprets this as in between each step the process requires delay (e.g. repositioning the tool (22) from milling the side (34) to milling a different surface (28) and consequently, in the meantime the distortion of side (34) will take place.

4. Claims 2 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lowe (USP 6,077,002), in view of Walker et al. (USP 6,219,916).

LOWE teaches a method of producing from a workpiece, a finished disc for a gas turbine engine, as set forth in the above rejection.

However, LOWE fails to teach the finished disc being produced from a forged workpiece. LOWE also fails to teach the machine tool being a lathe.

WALKER ET AL. teaches an integrally bladed fan rotor stage (38) comprising a disk (42) and blades (44) ('916, figure 2 and Col. 4, lines 28-32). WALKER ET AL. also teaches the disk being fabricated using conventional forging processes, commonly used to fabricate disks for conventional bladed rotor assemblies. Furthermore, WALKER ET AL. teaches the disk is preferably formed to its final shape by machining the disk in a lathe ('916, Col. 9, lines 6-11).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention was made to produced the finished disc of LOWE's invention from a forged workpiece., as taught by WALKER ET AL. because forging process is commonly used to fabricate disks for conventional bladed rotor assemblies ('916, Col. 9, lines 6-8). It would have also been obvious to one of ordinary skill in the art at the time of the invention was made to produced the finished disc of LOWE's invention using a lathe, as taught by WALKER ET AL. because this type of machining operation is preferred as well as being old and well known ('916, Col. 9, lines 9-11).

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sara Addisu at (571) 272-6082. The examiner can normally be reached on 8:30 am - 5 PM.



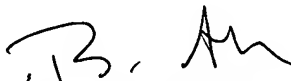
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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Boyer Ashley can be reached on (571) 272-4502. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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12/23/05

  
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